CLAIMS

What is claimed is:

1. A method of manufacturing a forged article including a surface, the method comprising:

defining a negative tooling pattern based on the surface;

providing a tooling set having a bottom die, a top die and an anvil, the bottom die being formed with an upper die surface that conforms to the negative tooling pattern, the anvil extending through the bottom die and defining an axis, the bottom die and the top die cooperating to define a die cavity;

placing a hollow blank on an anvil and into the die cavity between a top die and the bottom die; and

pressing the hollow blank between the top and bottom dies in a pressing direction that is generally parallel to the axis to form the forged article in single stroke, the hollow blank initially flowing in the pressing direction to substantially completely form the surface of the forged article and thereafter flowing in a direction generally perpendicular to the pressing direction to thereby fill the die cavity.

2. The method according to Claim 1, wherein before the hollow blank is pressed between the top and bottom dies, the method further comprises heating the hollow blank.

3. The method according to Claim 2, wherein the hollow blank is heated to a temperature of about 1700 degrees Fahrenheit to about 1800 degrees Fahrenheit.

4. The method according to Claim 1, further comprising dynamically re-crystallizing a material of the hollow blank to an ASTM grain size of about 7 to about 8 as the hollow blank is being pressed.

5. The method according to Claim 1, further comprising coating the hollow blank with a lubricant.

6. The method according to Claim 1, wherein the forged article is net shaped or near-net shaped.

7. The method according to Claim 1, further comprising forming the hollow blank such that it conforms to a predetermined volumetric size to thereby control a weight of the forged article.

8. The method according to Claim 1, further comprising sectioning a tube shaped billet to create the hollow blank.

9. The method according to Claim 1, further comprising removing an amount of excess material from a second surface of the forged article opposite the surface.

10. The method according to Claim 1, wherein the hollow blank is ring-shaped.

11. The method according to Claim 1, further comprising moving the anvil in a direction opposite the pressing direction to push the forged article away from the bottom die.

12. A method of manufacturing a ring gear including a surface having teeth, the method comprising:

defining a negative tooling pattern based on the surface;

providing a tooling set having a bottom die, a top die and an anvil, the bottom die being formed with an upper die surface that conforms to the negative tooling pattern, the anvil extending through the bottom die and defining an axis, the bottom die and the top die cooperating to define a die cavity;

placing a hollow blank on an anvil and into the die cavity between a top die and the bottom die; and

pressing the hollow blank between the top and bottom dies in a pressing direction that is generally parallel to the axis to form the ring gear in single stroke, the hollow blank initially flowing in the pressing direction to substantially completely form the surface of the ring gear and thereafter flowing in a direction generally perpendicular to the pressing direction to thereby fill the die cavity.

13. The method according to Claim 12, wherein before the hollow blank is pressed between the top and bottom dies, the method further comprises heating the hollow blank.

14. The method according to Claim 13, wherein the hollow blank is heated to a temperature of about 1700 degrees Fahrenheit to about 1800 degrees Fahrenheit.

15. The method according to Claim 12, further comprising dynamically re-crystallizing a material of the hollow blank to an ASTM grain size of about 7 to about 8 as the hollow blank is being pressed.

16. The method according to Claim 12, further comprising coating the hollow blank with a lubricant.

17. The method according to Claim 12, wherein the ring gear is net shaped or near-net shaped.

18. The method according to Claim 12, further comprising forming the hollow blank such that it conforms to a predetermined volumetric size to thereby control a weight of the ring gear.

19. The method according to Claim 12, further comprising sectioning a tube shaped billet to create the hollow blank.

20. The method according to Claim 12, further comprising removing an amount of excess material from a second surface of the ring gear opposite the surface.

21. The method according to Claim 12, wherein the hollow blank is ring-shaped.

22. The method according to Claim 12, further comprising moving the anvil in a direction opposite the pressing direction to push the ring gear away from the bottom die.